

***Pennilabium labanyaeanum* (Orchidaceae), a new species from Meghalaya, Northeast India**

C. Deori, N. Odyuo & A.A. Mao

Botanical Survey of India, Eastern Regional Centre,
Shillong-793003, Meghalaya, India
drchayadeoribsi@gmail.com
nodyuo@yahoo.com
aamao2008@gmail.com

ABSTRACT. A new orchid species, *Pennilabium labanyaeanum* C.Deori, N.Odyuo & A.A.Mao, is described and illustrated from Meghalaya, India. A key to the species of *Pennilabium* in India is provided.

Keywords. India, Meghalaya, new species, Orchidaceae, *Pennilabium*

Introduction

The genus *Pennilabium* J.J.Sm. (Orchidaceae) (*penni*- = feathered, *-labium* = lip) is a genus of 16 species of epiphytes in the tribe Vandeeae, subtribe Aeridinae. It is distributed from northeastern India and southern China to the Philippines and Sulawesi, with centres of diversity in Peninsular Malaysia and Borneo (Seidenfaden, 1988; O'Byrne, 2000; O'Byrne et al., 2009; Schuiteman, 2013; Govaerts, 2014; Pridgeon et al., 2014). The plants are small twig or branch epiphytes, the flowers are ephemeral and open in succession, and the lip is spurred with small or large and often fimbriate or marginally toothed side lobes, often with a fleshy mid-lobe. The column lacks a foot and contains two pollinia on a long strap-like stipe; the rostellum is normally beaked (Pridgeon et al., 2014).

In India two *Pennilabium* species are known, both of which are confined to the Northeast: namely, *P. proboscideum* A.S.Rao & J.Joseph from Meghalaya and *P. struthio* Carr from Arunachal Pradesh. During a botanical tour to Laitkhyrhong, 5 km from Smith, East Khasi Hills District, Meghalaya, in July 2014, the first two authors discovered a small *Pennilabium* with pure white flowers. After critical study of specimens and the literature (Holttum, 1957; Rao & Joseph, 1969; Garay, 1972; Comber, 1990; Rao, 1996), and comparison to the protologue and spirit material of the type specimen of the morphologically most similar taxon, *Pennilabium naja* P.O'Byrne (O'Byrne, 2000), this plant was found to be morphologically different from all other species. Our plant from Meghalaya is therefore described as the new species *Pennilabium labanyaeanum* C.Deori, N.Odyuo & A.A.Mao. Schuiteman (in Pridgeon et al., 2014: 230) points out that 'the generic delimitation of the genera closely allied to *Pteroceras*, including *Pennilabium*, needs further study, and *Pennilabium* is only tentatively accepted here'. Kocyan & Chase (in Pridgeon et al., 2014: 230) pointed

that only two *Pennilabium* species were sampled in their molecular study, and said ‘it would appear that some changes to the taxonomy of this clade will be required once greater sampling of the species has been accomplished.’

***Pennilabium labanyaeanum* C.Deori, N.Odyuo & A.A.Mao, sp.nov.**

Pennilabium labanyaeanum is similar to *P. naja* in having reduced sidelobes but differs in the flower being only half open; the sepals and petals pure white; the sepals obtuse, keeled dorsally and 5-veined; the lip base forming a narrow hollow channel with minute hairs; the lip epichile unlobed with erose margins, without a prominent raised callus but with an area of yellow powdery substance widening towards the lip apex; and the short white spur (see Table 1, Fig. 2). – TYPE: India, Meghalaya, Laitkyrhong, 5 km from Smith, East Khasi Hills, 1753 m, 25°26'53.2"N 91°52'48.6"E, 23 July 2014, Deori, C. & Odyuo, N. 131601 (holotype CAL [as 131601A]; isotypes ASSAM [as 131601B-E]). (Fig.1, 2)

Small monopodial epiphytic herbs, 3–5 cm tall, glabrous. **Roots** 5–30 cm long, 2–4 mm in diameter, several from base of stem below leaves, white with green tips. **Stems** 1–2.5 × 0.3–0.5 cm, very short, compressed with a few leaves close together. **Leaves** 1.5–6 × 0.5–1.5 cm, distichous, elliptic or broadly lanceolate, more or less fleshy, often twisted at the base, leathery, green, basally sheathing, unequally bilobed at apex, apices subacute to obtuse. **Inflorescence** 2.5–6 cm long, unbranched, lateral, emerging through sheath opposite leaf, erect or parallel to the leaves, producing 2–3 flowers in succession; peduncle 2–3.5 cm long, slender, cylindrical, base covered with two sheaths; sheathing sterile bracts below rachis two, c. 2 × 4.5 mm, somewhat rectangular in shape, lemon green; rachis 5–10 mm long, complanate-cylindrical, ridged with one to three distichously arranged flowers opening in succession; floral bract 2–2.5 × c. 1.5 mm, persistent, ovate-triangular, obtuse, lemon green. **Flowers** 12–14 mm long from the tip of the dorsal sepal to the tip of the spur, 8–10 mm broad, ephemeral, half open, formed in succession, sepals and petals pure white with yellow markings on the epichile of the lip. **Pedicel with ovary** 1–2.6 cm long, lemon green, 3-ridged. **Sepals** oblong with narrow bases, obtuse, 5-veined, on the dorsal side with keels which apically project as small apicules; dorsal sepal 7–10 × 3–4 mm; lateral sepals 8–9.5 × 3.5–4 mm. **Petals** 7.5–9 × 2.5–3 mm (base narrow), oblong with narrow base, obtuse with 3 main veins, lateral veins branched. **Lip** spurred, 11.5–12.5 mm long (including the spur), 4–5 mm wide at the centre and 3 mm at the apex, unlobed, suborbicular or ovate, lateral margins of lip erose; lip base with a narrow hollow channel with minute hairs within; epichile fleshy, solid, thick (1 mm in diameter), with an area of yellow powdery substance widening towards the lip apex. **Spur** 5–7 mm long from junction of lip base and the column, white, slender, tip rounded, 1.5 mm wide, aseptate and ecallose; longitudinal section of the spur shows sparse minute hair-like structure or raised edges at mouth towards the centre. **Column** 2–2.5 × c. 2 mm, without a foot, rounded, without stielidia; stigmatic cavity very broadly ovate; rostellum not seen. **Anther** 1–1.5 × 1.5–2 mm, operculum c. 0.2 × 0.5 mm, truncate, entire. **Pollinia** two,

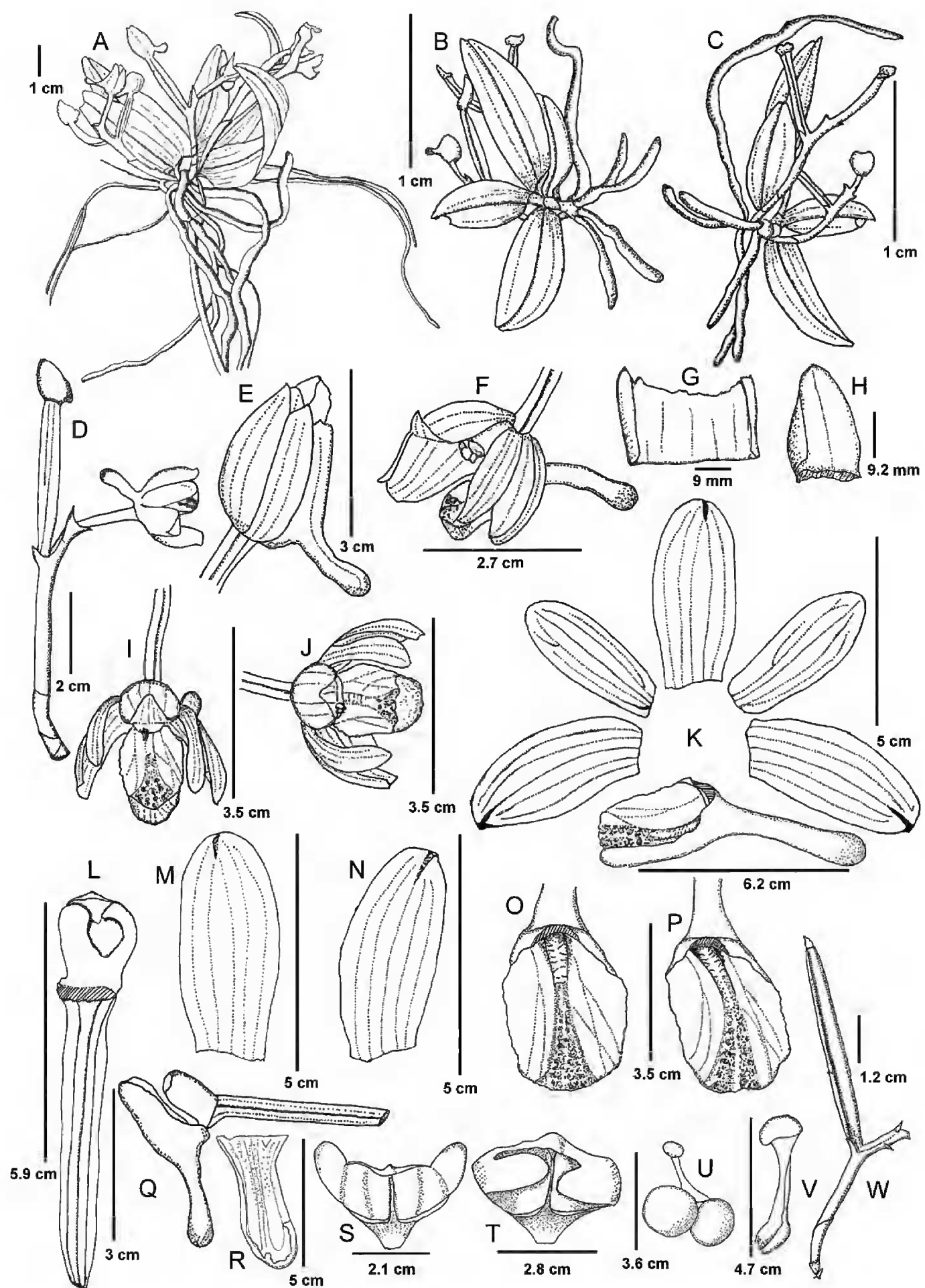
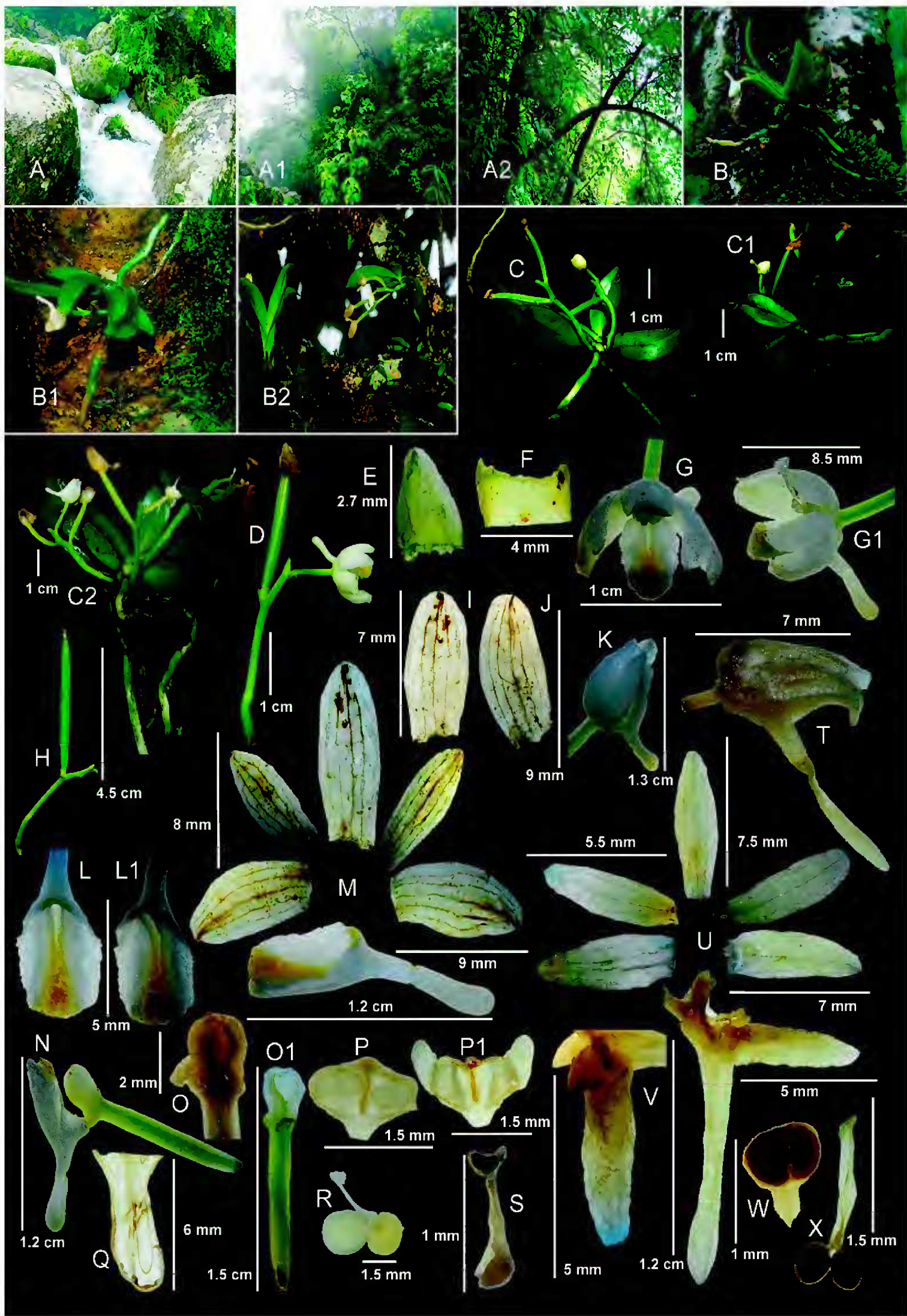


Fig. 1. *Pennilabium labanyaeanum* C.Deori, N.Odyuo & A.A.Mao. A–C. Habit. D. Inflorescence. E. Flower bud. F. Flower (side view). G. Peduncle sheath. H. Floral bract. I–J. Flower (front & side views). K. Floral perigon with spurred lip. L. Column with pedicel and ovary. M. Dorsal sepal (dorsal view). N. Lateral sepal (dorsal view). O. Lip (front view). P. Lip front view (highlighting the narrow hollow channel with minute hairs at the base). Q. Spurred lip (side view) with column, pedicel and ovary. R. Longitudinal section of spur. S–T. Anther (front views). U. Pollinia with stipe. V. Stipe. W. Fruit. (Drawn by: C. Deori)



c. 1 mm long (including stipe), 0.5–0.7 mm in diameter, globose, entire; stipe 0.7–1 mm long, widening near the attachment of the pollinia, with a small disc. **Fruits** erect, slender, 3–5.2 cm long which is more than twice the flower length, 3-ridged.

Distribution and habitat. *Pennilabium labanyaeanum* was found growing epiphytically on moss-covered branches of trees. The species was flourishing in a steep subtropical hill forest along a stream side at 1753 m altitude near Laitkyrhong, 5 km from Smith, East Khasi Hills District, Meghalaya, India. It was associated with other orchid species in the genera *Dendrobium* Sw. and *Eria* Lindl. s.l., amongst others.

Phenology. Flowering and fruiting: July–August.

Etymology. The specific epithet is given in honour of the first author's mother (L. Labanya Deori, 1945–1993).

Provisional IUCN conservation assessment. Data Deficient (DD). *Pennilabium labanyaeanum* is so far known only from a single locality in the East Khasi Hills District in Meghalaya. According to O'Byrne (2009), all species in the genus *Pennilabium* are uncommon or rare and occur in small colonies that can be widely separated from each other. If this is also the case for *Pennilabium labanyaeanum*, the new species might be more widespread in Meghalaya than is currently known and further exploration is necessary before a threat status can be given.

Notes. *Pennilabium labanyaeanum* is distinct in the genus due to its unlobed suborbicular lip. The new species is similar to *Pennilabium naja* from Sulawesi but differs as discussed above (see also Table 1, Fig. 2). As already pointed out by Garay (1972) there are two types of lip structure in *Pennilabium*: 1. Lateral lobes well developed and midlobe reduced to a small fleshy lobe; 2. Lateral lobes much reduced, possibly represented only by small auricle-like lobes, and midlobe very prominent,

Fig. 2. A–S. *Pennilabium labanyaeanum* C.Deori, N.Odyuo & A.A.Mao. A–A2. View of the type locality. B–B2. *Pennilabium labanyaeanum* in the wild. C–C2. Habit. D. Inflorescence. E. Floral bract. F. Peduncle sheath. G & G1. Flower, front & side views. H. Fruit. I. Dorsal sepal, dorsal view. J. Lateral sepal, dorsal view. K. Flower bud, side view. L. Lip, front view. L1. Lip, front view (highlighting the narrow hollow channel with minute hairs at the base). M. Floral perigon with spurred lip. N. Spurred lip(side view) with column, pedicel and ovary. O. Column, close view. O1. Column with pedicel & ovary. P & P1. Anther, front views. Q. Longitudinal section of spur. R. Pollinia with stipe. S. Stipe. *Pennilabium naja* P.O'Byrne (images taken from the spirit sample of the holotype O'Byrne SUL107 at SING) T. Flower, side view. U. Floral perigon with spurred lip. V. Lip, front view. W. Anther, front view. X. Pollinia with stipe. (Photos: C. Deori & N. Odyuo)

Table 1. Comparison of *Pennilabium naja* and *P. labanyaeanum*.

<i>Pennilabium naja</i>	<i>Pennilabium labanyaeanum</i>
The flowers are fully open with yellow sepals and petals, about 12 mm wide.	The flowers are not fully open with pure white sepals and petals, 8–10 mm wide.
Sepals spreading with recurved tips, oblong obtuse, 3-veined, not keeled.	Sepals not spreading, broadly oblong obtuse, 5-veined, keeled dorsally at the apex.
Lip spurred, fleshy, tongue shaped, white with lateral wings at the base of the spur aperture; side lobes not distinct; midlobe ovate in outline, recurved in centre, epichile obtuse, lamina concave with rolled under margins, fleshy, rugulose, raised into a broad low ridge along median line from base of callus to just before lip apex.	Lip spurred, fleshy, sub-orbicular, white with no lateral wings; sidelobe absent; midlobe not recurved at the centre, epichile unlobed with erose margins, without a prominent raised callus but with an area of yellow powdery substance widening towards the lip apex.
Spur yellow, 9–10 mm long, slender.	Spur white, 5–7 mm long.

fleshy and solid. Most of the species in the genus fall into the first category. Two of the three species found in India, *Pennilabium proboscideum* and *P. struthio*, have well developed side lobes, but the lip of the new species *P. labanyaeanum* lacks side lobes altogether, thereby separating it from all other species in the genus.

A key to the species of *Pennilabium* in India

- 1a.

Lip sidelobes present, large and fimbriate 2
- 1b.

Lip sidelobes absent *P. labanyaeanum*
- 2a.

Sepals and petals purple dotted, creamy white; lip sidelobes at least twice as long as broad at the truncate apex, which has erose-fimbriate edges
..... *P. proboscideum*
- 2b.

Sepals and petals yellowish with dark red; lip sidelobes not twice as long as broad near the truncate apex, which has a rim of dense, branching lacinia
..... *P. struthio*

ACKNOWLEDGEMENTS. The authors are thankful to Dr P. Singh, Director, Botanical Survey of India for encouragement and facilities. The authors are thankful to Dr André Schuiteman, Senior Researcher, Herbarium, Royal Botanic Gardens, Kew, for his comments in support of the novelty of the species described here. We are also grateful to Guat Bee from OSSEA (Orchid Society of Southeast Asia) for sending the protologue of *Pennilabium naja* and to Bazilah Ibrahim of the Herbarium at Singapore Botanic Gardens, for sending spirit material of the holotype of *Pennilabium naja* for study. We are also thankful to Rudan Khakhongor and Iboklang Kharhongor for assisting us during the field trip.

References

- Comber, J.B. (1990). *Orchids of Java*. UK: Royal Botanic Gardens, Kew.
- Garay, L. (1972). On the systematics of the monopodial orchids I. *Bot. Mus. Leafl.* 23(2): 149–212.
- Govaerts, R., Bernet, P., Kratochvil, K., Gerlach, G., Carr, G., Alrich, P., Pridgeon, A.M., Pfahl, J., Campacci, M.A., Holland Baptista, D., Tigges, H., Shaw, J., Cribb, P., George, A., Kreuz, K. & Wood, J.J. (2014). World Checklist of Orchidaceae. Royal Botanic Gardens Kew. <http://apps.kew.org/wcsp/home.do> (25 Jul. 2014).
- Holttum, R.E. (1957). *Flora of Malaya* (Orchidaceae), vol.1. Singapore: Government Printing Office.
- O’Byrne, P.O. (2000). Three new orchid species from Sulawesi. *Malayan Orchid Rev.* 34: 64.
- O’Byrne, P.O., Phoon, S.N. & Ong, P.T. (2009). *Pennilabium armarii*: A new species from Peninsular Malaysia. *Malesian Orchid J.* 3: 113–116.
- Pridgeon, A.M., Cribb, P.J., Chase, M.W. & Rasmussen, F.N. (2014). *Genera Orchidacearum*, vol. 6 (Epidendroideae, part 4). UK: Oxford University Press.
- Rao, A.S. & Joseph, J. (1969). *Pennilabium proboscideum* A.S. Rao & Joseph — A new orchid species from K. & J. Hills, Assam with incidental first record of the genus from India. *Bull. Bot. Surv. India* 10: 231.
- Rao, A.N. (1996). Five new records of orchids from Arunachal Pradesh, India. *J. Econ. Taxon. Bot.* 20(3): 708.
- Schuiteman, A. (2013). A very odd thing: *Pennilabium hewittii* (Orchidaceae). *Kew Bull.* 68: 679–681.
- Seidenfaden, G. (1988). Orchid genera in Thailand XIV. Fifty-nine Vandoid Genera. *Opera Bot.* 95: 330–332.